

REMARKS

The Office Action dated April 15, 2003, has been received and carefully noted. The above amendments and the following remarks are submitted as a full and complete response thereto. By this Amendment, claim 9 has been amended. No new matter has been added. Claim 11 has been allowed. Claims 9, 10, 12-15, 17 and 18, are pending and respectfully submitted for consideration.

Claim 9 was rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. The Applicants have amended claim 9 responsive to the rejection. The Applicants respectfully submit that all claims are in compliance with U.S. patent practice.

Claims 9 and 13 were rejected under 35 U.S.C. § 103(a) as being unpatentable over GKN. Claim 13 depends from claim 9. The Applicants respectfully submit that claims 9 and 13 are neither disclosed nor suggested by GKN.

Claim 9 recites a drive wheel bearing assembly having a fixed type constant velocity universal joint, coupled to a wheel bearing, mounted to one end portion of an intermediate shaft. A sliding type constant velocity universal joint is coupled to a differential, mounted to the other end portion of said intermediate shaft. An allowable plunging down to a bottom portion of an outer joint ring of said sliding type constant velocity universal joint is set substantially equal to a sum of a width of an inner joint ring of said fixed type constant velocity universal joint. A length of a projection of the intermediate shaft beyond an edge surface of said inner joint ring, at a minimum operative angle of the sliding type constant velocity universal joint.

As a result of the claimed configuration of elements, assembling and disassembling procedures can be simplified, and the drive wheel assembly can have a reduced weight and size thereby improving the performance of the vehicle. The Applicants respectfully submit that the prior art fails to disclose or suggest the claimed features of the invention and, therefore, fails to provide the critical non-obvious advantages that are provided by the invention.

GKN discloses a constant velocity joint and drive shaft application. Fig. B on page 16 of GKN discloses a rear drive shaft for a rear-wheel drive, an all-wheel drive and a four-wheel drive vehicle. Page 12 of GKN discloses constant velocity plunging joints and double offset joints. The fixed joint and the double offset joint in Fig. B are connected by a shaft. The double offset constant velocity plunging joints permit angular excursion of up to 24 degrees and axial (plunging) movement of up to 55 mm. The double offset plunging joints have a shaft diameter of between 24 mm and 29 mm. Another undercut free fixed joints have shafts of 24 mm to 40 mm.

With respect to claim 9 from which claim 13 depends, the Applicants respectfully submit that claim 9 is not obvious in view of GKN. Claim 9 recites an allowable plunging down to a bottom portion of an outer joint ring of the sliding type constant velocity universal joint is set substantially equal to a sum of a width of an inner joint ring of the fixed-type constant velocity universal joint and a length of a projection of the intermediate shaft beyond an edge surface of the inner joint ring. The Office Action acknowledged that GKN does not expressly disclose this claimed feature and took the position that the allowable plunging down is an obvious design choice.

The Applicants submit however, that claim 9 is not obvious in view of GKN for two reasons. First, the allowable plunging down recited in claim 9 is not a design choice. Second, the Office Action has not provided the required objective reasons why one of ordinary skill in the art would set the allowable plunging down as recited in claim 9.

The allowable plunging down is not a design choice because the allowable plunging down solves a particular problem in the prior art. Specifically, the specification discloses that by setting the allowable plunging H_1 to the dimension $K_1 + L_1$, it is possible to dismount the intermediate shaft from the inner joint ring on the fixed type constant velocity universal joint by sliding the sliding portion of the sliding type constant velocity universal joint in an axially inboard direction by the amount of the allowable plunging without dismounting the drive shaft from the vehicle body. See page 55, lines 6-18 of the specification. As a result, assembling and disassembling procedures or the replacement of the boot can be simplified, improving the workability of the drive wheel bearing assembly. In contrast, GKN fails disclose a problem that would require modifying its structure by setting the allowable plunging down as recited in claim 9. In other words, GKN fails to provide a teaching or suggestion to modify its own teachings in the manner recited in claim 9. Since the allowable plunging down provides significant advantages in the invention that are not recognized by the GKN reference, the allowable plunging down recited in claim 9 is not a design choice. Accordingly, claim 9 is not obvious in view of GKN.

The Applicants also submit that the Office Action has failed to establish a *prima facie* case of obviousness of claims 9 and 13 because the Office Action did not provide

an objective reason why one of ordinary skill in the art would set the allowable plunging down as recited in claim 9. The Office Action took the position that it would have been obvious to one of ordinary skill in the art at the time the invention was made to “optimize the proportion of the allowable plunge to match the width of the fixed joint inner ring and the projection portion of the inner shaft, *as such practice is a design consideration within the skill of the art.*” However, the Office Action’s reason is not an objective reason. As such, the Office Action’s position regarding the alleged obviousness of claim 9 is not sufficient to establish *prima facie* obviousness. Therefore, the Applicants submit that the rejection of claims 9 and 13 is improper.

Claim 10 was rejected under 35 U.S.C. § 103(a) as being unpatentable over GKN in view of Mizukoshi et al. (U.S. Patent No. 5,975,767, “Mizukoshi”). GKN was cited as disclosing many of the claimed elements of the invention with the exception of a hollow portion communicating with a house portion of the outer joint ring. Mizukoshi was cited for curing this deficiency.

Mizukoshi discloses a tone wheel for a constant velocity joint. The joint has a hub 4b formed in the hollow cylindrical shape to communicate the axial opposite ends with each other and to make the rolling bearing unit for the vehicle wheel lightweight.

With respect to claim 10, the Applicants respectfully submit that the combination of GKN and Mizukoshi fails to disclose the claimed features of the invention. Claim 10 depends from claim 9. As discussed above, claim 9 is not obvious in view of GKN in that the allowable plunging down recited in claim 9 is not a design choice and the Office Action did not set forth an objective reason why claim 9 would be obvious. Mizukoshi fails to cure the deficiencies in GKN with respect to claim 9, as Mizukoshi also does not

disclose the allowable plunging down recited in claim 9. Accordingly, the combination of GKN and Mizukoshi fails to disclose or suggest the features of the invention as recited in claim 9, and therefore, dependent claim 10.

Claims 12, 15, 17 and 18 were rejected under 35 U.S.C. § 103(a) as being unpatentable over GKN in view of Fukumura (U.S. Patent No. 5,607,241). The GKN reference was cited for teaching many of the claimed elements of the invention, with the exception of the wheel bearing being plastically connected to an outer joint ring of the fixed type constant velocity universal joint; bearing races on a hub ring, an outer diameter portion of an outer joint ring of the fixed type constant velocity universal joint, and the outer diameter portion of a separate inner ring above the hub ring. Fukumura was cited for curing these deficiencies.

Fukumura discloses a wheel bearing assembly having a rotating member 1 made up of an outer ring 2 of a homokinetic joint and a hub 3 connected to one end of the outer ring 2. The outer ring 2 has a cylindrical shaft portion on which the hub 3 is pressed-fitted. The shaft portion 4 and the hub 3 are welded together at one of their joint areas. The shaft portion 4 and the hub 3 can be welded by spot welding, laser welding, electron beam welding or any other welding that produces less heat. A bearing inner ring 13 is fitted on one end of the hub 3 to rollably support one of two rows of balls 8a and 8b.

With respect to claims 12, 15, 17 and 18, the Applicants respectfully submit that the combination of GKN and Fukumura fails to disclose or suggest the claimed features of the invention. Claims 12, 15, 17 and 18 depend from claim 9. As discussed above, claim 9 is not obvious in view of GKN in that the allowable plunging down recited in

claim 9 is not a design choice and the Office Action did not set forth an objective reason why claim 9 would be obvious. Fukumura fails to cure the deficiencies in GKN as Fukumura does not disclose the allowable plunging down recited in claim 9. Accordingly, the combination of GKN and Fukumura fails to disclose or suggest all of the claimed features of the invention as recited in claim 9 and therefore, dependent claims 12, 15, 17 and 18.

With regard to each of the rejections under §103 in the Office Action, it is respectfully submitted that the Office Action has not set forth a *prima facie* case of obviousness. The PTO has the burden under §103 to establish a *prima facie* case of obviousness. In re Fine, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). To establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Third, the prior art references when combined must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, not in applicant's disclosure. In re Vaeck, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

As set forth above, the combinations of GKN and Mizukoshi and GKN and Fukumura fail to cure the deficiencies in GKN with respect to claim 9, and therefore, fail to disclose or suggest all of the claim limitations. Accordingly, the Applicants respectfully submit that the Office Action has failed to establish a *prima facie* case of

obviousness for purposes of a rejection of claims 9, 10, 12, 15, 17 and 18 under 35 U.S.C. §103.

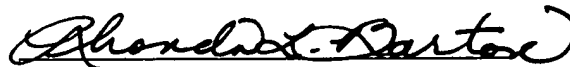
The Applicants wish to thank the Examiner for allowance of claim 11.

Claims 1-38 are pending. Claims 1-8, 16 and 19-38 have been withdrawn from consideration. Claims 10, 12-15, 17 and 18 depend from claim 9. The Applicants submit that these dependent claims are allowable for their dependency from claim 9, as well as for the additional subject matter recited therein. As discussed above, GKN, Mizukoshi and Fukumura, either singly or in combination, do not disclose or suggest each and every feature of the claimed invention. Accordingly, the Applicants respectfully request allowance of claims 9, 10, 12-15, 17 and 18, and the prompt issuance of a Notice of Allowability.

Should the Examiner believe anything further is desirable in order to place this application in better condition for allowance, the Examiner is requested to contact the undersigned at the telephone number listed below.

In the event this paper is not considered to be timely filed, the Applicants respectfully petition for an appropriate extension of time. Any fees for such an extension, together with any additional fees that may be due with respect to this paper, may be charged to counsel's Deposit Account No. 01-2300, **referencing docket number 100725-00026.**

Respectfully submitted,



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Enclosure: Petition for Extension of Time (2-months)